The following is a complete listing of all claims in the application, with an indication of the status of each:

Listing of claims:

1. (Currently amended) A thermionic cathode comprising

a crystalline emitter having a tip and a cone and sides, wherein said cone is positioned between said tip and said sides; and

a carbon coating applied to [the] an outer surface of said cone, wherein said sides of said crystalline emitter are not carbon coated.

2. (Original) A thermionic cathode as in claim 1, wherein said crystalline emitter is single crystal Lanthanum Hexaboride (LaB6).

3. (Original) A thermionic cathode as in claim 1, wherein said cone has a cone angle in the range of 20 to 60 degrees.

4. (Original) A thermionic cathode as in claim 1, wherein said carbon coating is selected from the group consisting of pyrolytic carbon and diamond-like carbon (DLC).

5. (Original) A thermionic cathode as in claim 1, wherein said cone has a surface micro-roughness and wherein said carbon coating has a thickness of a least twice said micro-roughness.

6. (Previously presented) A thermionic cathode as in claim 5, wherein said thickness is from 2 to 20 μm.

7. (Currently amended) An improvement in a thermionic cathode having a crystalline emitter with a tip and a cone and sides, wherein said cone is positioned between said tip and said sides, the improvement comprising:

a carbon coating applied to an outer surface of said cone, wherein said sides of said crystalline emitter are not carbon coated.

8. (Original) The improvement of claim 7, wherein said crystalline emitter is single crystal Lanthanum Hexaboride (LaB6).

9. (Original) The improvement of claim 7, wherein said cone has a cone angle in the range of 20 to 60 degrees.

10. (Original) The improvement of claim 7, wherein said carbon coating is selected from the group consisting of pyrolytic carbon and diamond-like carbon (DLC).

11. (Original) The improvement of claim 7, wherein said cone has a surface micro-roughness and wherein said carbon coating has a thickness of at least twice said micro-roughness.

12. (Previously presented) The improvement of claim 11, wherein said thickness is from 2 to 20 μm.

13. (Currently amended) An electron emission apparatus, comprising

a thermionic cathode comprising

a crystalline emitter having a tip and a cone and sides, wherein said cone is positioned between said tip and said sides; and

a carbon coating applied to [the] an outer surface of said cone, wherein said sides of said crystalline emitter are not carbon coated;

an emitter heater; and

a support for said crystalline emitter.

14. (Original) An electron emission apparatus as in claim 13, wherein said crystalline emitter is single crystal Lanthanum Hexaboride (LaB6).

15. (Original) An electron emission apparatus as in claim 13, wherein said cone has a cone angle in the range of 20 to 60 degrees.

16. (Original) An electron emission apparatus as in claim 13, wherein said carbon coating is selected from the group consisting of pyrolytic carbon and diamond-like carbon (DLC).

17. (Original) An electron emission apparatus as in claim 13, wherein said cone has a surface micro-roughness and wherein said carbon coating has a thickness of at least twice said micro-roughness.

18. (Previously presented) An electron emission apparatus as in claim 17, wherein said thickness is from 2 to 20 μm.

19. (Currently amended) A method of manufacturing a crystalline emitter for use in a thermionic cathode, comprising the step of

applying a carbon coating to an outer surface of a cone of said crystalline emitter, wherein said carbon coating is not applied to sides of said crystalline emitter which are located below said cone.

20. (Original) The method of claim 19, wherein said carbon coating contains no pinholes.

21. (Original) The method of claim 19, wherein said crystalline emitter is single crystal Lanthanum Hexaboride (LaB6).

22. (Original) The method of claim 19, wherein said cone has a cone angle in the range of 20 to 60 degrees.

23. (Original) The method of claim 19, wherein said carbon coating is selected from the group consisting of pyrolytic carbon and diamond-like carbon (DLC).

24. (Original) The method of claim 19, wherein said cone has a surface micro-roughness and wherein said carbon coating has a thickness of at least twice said micro-roughness.

25. (Previously presented) The method of claim 24, wherein said thickness is from 2 to 20 μm.